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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/724,726	11/28/2000	Gyula Hadlaczky	17084-004006 / 402E	7776

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/724,726	HADLACZKY ET AL.	
	Examiner	Art Unit	
	Brent Page	1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 June 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *50-52,73-115 and 117-127* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *50-52,73-115 and 117-127* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 November 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *03/29/2006, 04/30/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 05/30/2007 has been entered. Claims 50-52, 73-115 and 117-127 are pending and examined on the merits in the following office action.

Response to Arguments

Applicants urge on page 16 of the preliminary amendment that centromeric DNA sequence information is not required for the generation of a satellite artificial chromosome in any eukaryotic cell including plants.

This is not persuasive because the structure and function of centromeres directly relates to whether or not the artificial chromosomes generated by the claimed methods, are, in fact, enabled. The difference between plant centromeres and mammalian centromeres and unpredictability associated with these differences determines both whether or not a dicentric chromosome may even form when applying these methods to plants, and further, whether or not the centromere formed would be capable of maintaining the chromosome after cell division. Regardless of whether or not centromere sequences are part of the exogenous DNA targeted to the plant chromosome, the predictability and knowledge of plant centromere function and

structure is required to predict whether or not the function and structure are sufficiently similar to mammalian centromeres that the claimed methods would actually function the same in a plant cell as demonstrated in a mammalian cell.

Applicants also urge that the declarations of Fabijanski of 28 May 2007 and Hadlaczky 28 May 2007 demonstrate the generation of plant SATACs using the methods described in the instant application.

This is not persuasive because Fabijanski discloses methods not disclosed in the current application that are specific to plants including cytological and transformation techniques. The cytological techniques appear to be absolutely crucial to the claimed invention, as identification of the generated artificial chromosomes is crucial to isolation of said chromosomes. This is also not persuasive because there are elements not sufficiently demonstrated in the declaration. In addition to unexplained background staining of both the selection marker and the amplified rDNA probe, the demonstration of a dicentric chromosome fails to make clear two primary constrictions as the indicated second primary constriction does not appear to have any heterochromatin on the other side of it, and is in fact, indistinguishable from the black background that is devoid of heterochromatin. Furthermore, there is no demonstration that the claimed SATACs are maintained in dividing cells. The data do not demonstrate the transmission of the SATACs in plant cells. See *Genentech, Inc. v. Novo Nordisk, A/S*, 42 USPQ2d 1001, 1005 (Fed. Cir. 1997), which teaches that disclosure of a "mere germ of an idea does not constitute [an] enabling disclosure", and that "the specification, not the knowledge of one skilled in the art" must supply the enabling aspects of the invention.

This is further not persuasive because the data presented by Hadlaczky is only associated with mammalian SATACs which are not material to the instant claims. Furthermore, Hadlaczky is expressing an opinion in regard to plant SATACs rather than evidence, see Voisnet v. Coglianese and McCorkle, 173 USPQ 16 (CCPA 1972), which teaches that the opinion testimony of an expert witness does not establish any material fact and may be rejected in favor of other evidence.

Applicants urge that the disclosure does not need to teach every embodiment of the claimed invention especially where routine experimentation would allow one to practice and use the invention.

This is not persuasive because there are many differences between plant and animal cells that would make it unpredictable to simply apply the methods taught in the specification to a plant cell. Routine experimentation would not overcome the obstacles that the plant cell wall poses, nor the vastly different DNA compositions of plants, nor the differences in misdivision between plant and animal cells when it comes to chromosome segregation. The cytological technique differences alone prevent one from merely applying the methods taught in the specification to plant cells.

Applicants also urge that plant SATACs are taught in the specification "in great detail" along with methods of producing them.

This is not persuasive because the specification fails to mention the term "plant SATAC" in even a single occurrence. No DNA sequences, working examples or even plant species are discussed in the specification in relation to the generation of SATACs. Plant species and methods relating to them are discussed only in the context of

transformation techniques and not in the context of the generation of artificial chromosomes. Applicant is invited to point out exactly where in the specification "plant SATACs" are discussed in "great detail".

Applicants urge that the level of skill in this art is recognized to be high, and that one of such skill would be able to apply such teachings to making non-animal SATACs.

This is not persuasive because the state of the art discussed in the previous office action cited peer-reviewed journal articles by those of skill in the art that demonstrate the unpredictability of applying such teachings from mammalian systems to plant systems.

Applicants' main arguments summarized from page 15-23 appear to be that the specification teaches the generation of SATACs generally, and that these teachings would apply to many different species.

This is not persuasive because the specification throughout has multiple references to specific mammalian sequences, constructs and cell lines, and the procedures involving the generation appear to be specific to the mammalian SATACs. This is evidenced in the multiple references to MACs, or Mammalian Articifial Chromosomes. While the specification does mention in passing that these procedures should work on other species, there is no demonstration of this in the specification, and there is no guidance that would teach one to modify the procedures sufficiently to actually generate the SATACs reliably in other species.

Applicants further urge (pages 15-20 of the reply) that multiple techniques are present in the specification for introduction of SATACs into cells, methods for producing

transgenic plants were known in the art, materials and methods for applying the procedures to plants were readily available and that the presence of working examples is sufficient for enablement.

This is not persuasive because none of the taught methods for plants were modified to account for the generation and/or isolation or the introduction of SATACs into plants. The methods mentioned in the specification only demonstrate the transformation options for plants of DNA constructs, not SATACs which would have considerably more DNA and require significant modification before successful introduction into a plant cell could be achieved. The working examples are all for mammalian cell lines and none are for other species.

Applicants further urge that applying the teachings of the specification combined with the skill and knowledge of the art would result in predictable success for transferring SATACs into plant cells.

This is not persuasive because the unpredictability cited in the previous office action has not successfully been overcome. The transmission of SATACs has not been demonstrated in plants and the introduction of SATACs into plants has not been demonstrated.

Applicants point out that they are entitled to claims that are commensurate in scope with the teachings of the specification. The main argument seems to be that one using the methods taught in the application could generate SATACs in any species. Without agreeing to the veracity of that statement, the Examiner points out that by their own admission Applicants already have patents drawn to the generic scope with which

they claim they are entitled to. However, in the instant application, Applicants appear to be claiming a species within that scope. In order to have a particular species enabled, in this case under the broad heading of "plants", one should have at least demonstrated even one species of plant in which the methods were applied. Applicants do not demonstrate anywhere in the application the generation of a plant SATAC, nor do they demonstrate the isolation of a plant SATAC. The declarations presented by Applicant may only overcome the enablement rejection if the declarations clearly show that the exact method steps taught in the specification were used exactly the same on plant cells and a successful generation, transmission and isolation of a plant SATAC was achieved. However, as shown in the declaration, one does have to modify the conditions associated with the methods and the exact same methods were not therefore used to generate and obtain plant SATACs.

It is believed that main arguments presented by Applicant have been herein addressed. The claims are examined herein on the merits. As noted by Applicant, this action is made non-final with the addition of the provisional Double Patenting rejection.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 50-52, 73-115 and 117-127 remain rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The claims remain rejected for the reasons of record in the office actions filed 01/17/2003, 10/22/2003, 08/12/2004, 05/09/2005, and 3/30/2006, as well as reasoning set forth below.

The claims are broadly drawn to a plant artificial chromosome, any plant cell comprising a plant artificial chromosome, a method for producing any transgenic plant comprising introducing a plant artificial chromosome into any plant cell and any transgenic plant comprising a plant artificial chromosome.

In contrast, the specification only provides guidance for a satellite artificial chromosome in mammalian cells, specifically, mouse cells, and a mammalian artificial chromosome. The specification does not provide guidance for any plant artificial chromosomes, sequences, or methods of making same, or any plant cells comprising any artificial chromosomes.

In a review of artificial chromosomes, Willard (2000 Science 17:1308-1309) discloses that the components necessary for a functioning artificial chromosome are telomeres, a centromere, and an origin of replication (see page 1308 third and fourth paragraphs, for example). Willard states "without a functional centromere, artificial chromosomes are unstable, fail to attach to the spindle, and are quickly lost" (see page 1308 fifth paragraph).

The DNA components necessary for a functioning plant artificial chromosome were not known at the time of invention.

The DNA component necessary for an origin of replication in plants was unknown at the time of invention and therefore unpredictable in function. In a review of Origins and complexes, Bryant et al (2001 Journal of Experimental Biology 52:193-202) discuss the features and sequences of an origin of replication in plants. Bryant et al disclose that very few replication origins have been isolated from multicellular eukaryotes, and that most attempts to identify putative replication origins have relied on identifying ARS elements (see page 194, second full paragraph). Bryant et al disclose, that such elements, are unpredictable in the functioning of an origin in plants, and merely identify the ability of the sequences to function in yeast. Bryant et al state "The presence of budding yeast-type ARS elements in plant DNA does not therefore show that these elements are involved in replication origin in plants. Indeed, recent studies on origins of replication in the fission yeast Schizosaccharomyces pombe have indicated that S. cerevisiae may be a poor model for the structure of eukaryotic replication origins" (see page 194, second column, upper third of first full paragraph). Bryant et al further state "Understanding of the structure of plant DNA replication origins is further complicated by the findings that origin-to-origin spacing may vary in plant development, or in response to nutrients or hormones or to experimental manipulation" (see page 195 beginning of second paragraph). Bryant et al further disclose that nucleosome spacing and chromosome structure may be important for determining

whether or not an origin is active (see page 195 second column end of first paragraph, for example).

Chromosome structure of animals is different than that of plants. Avramova (2002 Plant Physiology 129:40-49) discusses the heterochromatin of animals and plants. In plants, heterochromatin is located at the nuclear organizer and at the knobs, while in animals the heterochromatin is found in the telomeres, centromeres, and pericentric regions of the chromosome. Furthermore, there are no similar proteins to those known in animals to be associated with heterochromatin. (see page 41 second column third paragraph, for example).

Satellite DNA in mammals is different than that of satellite DNA in plants. In animals and yeast, satellite DNA is AT-rich while in plants, satellite DNA tends to be GC-rich (Ferl et al in Buchanin et al 2000 Biochemistry and Molecular Biology of Plants, American Society of Plant Physiologists, Rockville, MD 20855, page 324). This basic difference in satellite DNA content would make the functioning of animal satellite DNA in plants as part of an artificial chromosome unpredictable.

The function of a centromeric region, is likewise unpredictable. Hall et al (2004 Current Opinion in Plant Biology 7:108-114) in a comprehensive review of plant centromeres discuss the field of plant centromeres and point out that although studies implicate satellites and retro-elements as important DNA sequences for centromere function, potential roles for other sequences have not been ruled out (see page 112, 3rd paragraph, for example). Furthermore, Hall et al teach that efforts to sequence the rice and maize centromeres were not complete as of the date of publication, and therefore

centromeric sequences of the claimed invention could not have been known at the time of invention (see page 109 first paragraph).

Given the state of the art and the disclosures of Willard, Bryant et al, Avramova, Ferl et al, and Hall et al, the unpredictability and the lack of guidance as discussed above, undue experimentation would have been required by one of skill in the art to identify, isolate, and evaluate the components necessary to produce a SATAC in a plant cell, isolate said SATAC, and/or transform a plant with said SATAC.

For these reasons and the reasons of record as stated above the rejection of the claims under 35 U.S.C. 112, first paragraph enablement are maintained.

Claims 50-52, 73-115 and 117-127 remain rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement for the reasons of record as well as the reasoning set forth below. The claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

The claims are broadly drawn to a plant artificial chromosome, any plant cell comprising a plant artificial chromosome, a method for producing any transgenic plant comprising introducing a plant artificial chromosome into any plant cell and any transgenic plant comprising a plant artificial chromosome.

In contrast, the specification only provides guidance for a satellite artificial chromosome in mammalian cells, specifically, mouse cells, and a mammalian artificial chromosome. The specification does not provide guidance for any plant artificial

chromosomes, sequences, or methods of making same, or any plant cells comprising any artificial chromosomes.

The Federal Circuit has recently clarified the application of the written description requirement. The court stated that a written description of an invention "requires a precise definition, such as by structure, formula, [or] chemical name, of the claimed subject matter sufficient to distinguish it from other materials." University of California v. Eli Lilly and Co., 119 F.3d 1559, 1568; 43 USPQ2d 1398, 1406 (Fed. Cir. 1997). The court also concluded that "naming a type of material generally known to exist, in the absence of knowledge as to what that material consists of, is not a description of that material." Id. Further, the court held that to adequately describe a claimed genus, Patent Owner must describe a representative number of the species of the claimed genus, and that one of skill in the art should be able to "visualize or recognize the identity of the members of the genus." Id.

Finally, the court held:

A description of a genus of cDNAs may be achieved by means of a recitation of a representative number of cDNAs, defined by nucleotide sequence, falling within the scope of the genus or a recitation of structural features common to members of the genus, which features constitute a substantial portion of the genus. Id.

See also MPEP section 2163, page 174 of chapter 2100 of the August 2005 version, column 1, bottom paragraph, where it is taught that

[T]he claimed invention as a whole may not be adequately described where an invention is described solely in terms of a method of its making coupled with its function and there is no described or art-recognized correlation or relationship between the structure of the invention and its function. A biomolecule sequence described only by a functional characteristic, without any known or disclosed correlation between that function and the structure of the sequence, normally is not a sufficient identifying

characteristic for written description purposes, even when accompanied by a method of obtaining the claimed sequence.

See also Amgen Inc. v. Chugai Pharmaceutical Co. Ltd., 18 USPQ 2d 1016 at 1021, (Fed. Cir. 1991) where it is taught that a gene (which includes a promoter) is not reduced to practice until the inventor can define it by "its physical or chemical properties" (e.g. a DNA sequence).

Given the claim breadth and lack of guidance as discussed above, the specification fails to provide an adequate written description of the genus of sequences as broadly claimed. Given the lack of written description of the claimed genus of sequences, any method of using them, such as transforming plant cells and plants therewith, and the resultant products including the claimed transformed plant cells and plants containing the genus of sequences, would also be inadequately described. Accordingly, one skilled in the art would not have recognized Applicant to have been in possession of the claimed invention at the time of filing. See the Written Description Requirement guidelines published in Federal Register/ Vol. 66, No. 4/ Friday January 5, 2001/ Notices: pp. 1099-1111.

Response to Arguments relating to 112 first paragraph rejection

Arguments are largely duplicative and have been addressed in previous office actions. The main arguments are addressed below to further clarify these rejections. Also in the interest of clarity and compact prosecution, the arguments as applied to both first paragraph enablement and written description are addressed below.

Applicants emphasize that in the guidelines for written description possession of invention may be shown in many ways including

(1) describing an actual reduction to practice of the claimed invention

(2) a clear depiction of the invention in detailed drawings of in structural chemical formulas, or

(3) any description of distinguishing identifying characteristics so long as a person skilled in the art would recognize that the inventor had possession of the claimed subject matter.

Applicants have not satisfied **ANY** of these means and have not demonstrated possession of the claimed subject matter. The reduction of practice has NOT been shown in the specification as it relates to plant SATACS or plant cells maintaining SATACS, only the demonstration and description of mammalian SATACS and mammalian cells is present in the specification.

No clear depiction by detailed drawings, pictures, or structural formulas have been shown that are particular to plant SATACS or plant cells containing SATACS. The drawings submitted by Applicant clearly represent particular cell lines and satellite DNA that is specific to mammalian SATACS and mammalian cells. Generic drawings indicating universality are **NOT** present in the instant application.

There are no distinguishing or identifying characteristics set forth in the instant application that would give any indication to one of skill in the art that Applicant had possession of plant SATACs or plant cells containing SATACs. No particular sequences or structures were described or presented that would give one of skill in the art any indication of the claimed subject matter. The more particular aspects of this are discussed below.

Applicants urge on page 16 of the preliminary amendment that centromeric DNA sequence information is not required for the generation of a satellite artificial chromosome in any eukaryotic cell including plants.

This is not persuasive because the structure and function of centromeres directly relates to whether or not the artificial chromosomes generated by the claimed methods, are, in fact, enabled. The difference between plant centromeres and mammalian centromeres and unpredictability associated with these differences determines both whether or not a dicentric chromosome may even form when applying these methods to plants, and further, whether or not the centromere formed would be capable of maintaining the chromosome after cell division. Regardless of whether or not centromere sequences are part of the exogenous DNA targeted to the plant chromosome, the predictability and knowledge of plant centromere function and structure is required to predict whether or not the function and structure are sufficiently similar to mammalian centromeres that the claimed methods would actually function the same in a plant cell as demonstrated in a mammalian cell. Furthermore, one can not determine whether or not purported fragments in a given cell even contain a centromere if they are not in possession of the means to test whether or not that centromere is present in the fragment. Without knowledge of a centromere sequence, or a sequence associated with the centromere, one would not be able to show that the fragment, in fact contains such a sequence or structure, and therefore could not show possession of the claimed invention. This is particularly important given that Applicant has stated on page 11 of their response that "plant artificial chromosomes... refer to chromosomes that

include...plant centromeres". Given the requirement of plant artificial chromosomes to include centromeres as admitted by Applicant, knowledge of what the centromere contains both structurally and functionally would be crucial to understanding and knowing whether or not the fragments generated in a plant cell actually contain such a structure. Even if it were agreed that no knowledge of centromere DNA sequence is necessary for the generation of a SATAC, **knowledge of such sequence is quite critical to show that a SATAC has indeed been generated, given the requirement of the SATAC to contain a plant centromere**.

Applicants also urge that the declarations of Fabijanski of 28 May 2007 and Hadlaczky 28 May 2007 demonstrate the generation of plant SATACs using the methods described in the instant application.

This is not persuasive because Fabijanski discloses methods not disclosed in the current application that are specific to plants including cytological and transformation techniques. The cytological techniques appear to be absolutely crucial to the claimed invention, as identification of the generated artificial chromosomes is crucial to isolation of said chromosomes. This is also not persuasive because there are elements not sufficiently demonstrated in the declaration. In addition to unexplained background staining of both the selection marker and the amplified rDNA probe, the demonstration of a dicentric chromosome fails to make clear two primary constrictions as the indicated second primary constriction does not appear to have any heterochromatin on the other side of it, and is in fact, indistinguishable from the black background that is devoid of heterochromatin. Furthermore, there is no demonstration that the claimed SATACs are

maintained in dividing cells. The data presented by Fabijanski do not demonstrate the transmission of the SATACs in plant cells. See *Genentech, Inc. v. Novo Nordisk, A/S*, 42 USPQ2d 1001, 1005 (Fed. Cir. 1997), which teaches that disclosure of a "mere germ of an idea does not constitute [an] enabling disclosure", and that "the specification, not the knowledge of one skilled in the art" must supply the enabling aspects of the invention.

The declaration of Hadlaczky is not persuasive because the data presented by Hadlaczky is only associated with mammalian SATACs which are not material to the instant claims. Furthermore, Hadlaczky is expressing an opinion in regard to plant SATACs rather than evidence, see Voisnet v. Coglianese and McCorkle, 173 USPQ 16 (CCPA 1972), which teaches that the opinion testimony of an expert witness does not establish any material fact and may be rejected in favor of other evidence.

Applicants urge that the disclosure does not need to teach every embodiment of the claimed invention especially where routine experimentation would allow one to practice and use the invention.

This is not persuasive because there are many differences between plant and animal cells that would make it unpredictable to simply apply the methods taught in the specification to a plant cell. Routine experimentation would not overcome the obstacles that the plant cell wall and plant cell pose, nor the vastly different DNA compositions of plants, nor the differences in misdivision between plant and animal cells when it comes to chromosome segregation. The cytological technique differences between mammals

and plants prevent one from merely applying the methods taught in the specification to plant cells and plants.

Applicants also urge on pages 16-22 that plant SATACs are taught in the specification "in great detail" along with methods of producing them.

This is not persuasive because the specification fails to mention the term "plant SATAC" in even a single occurrence. No DNA sequences, working examples or even plant species are discussed in the specification in relation to the generation of SATACs. Plant species and methods relating to them are discussed only in the context of transformation techniques and not in the context of the generation of artificial chromosomes. Applicant is invited to point out exactly where in the specification "plant SATACs" are discussed in "great detail".

Applicants urge that the level of skill in this art is recognized to be high, and that one of such skill would be able to apply such teachings to making non-animal SATACs.

This is not persuasive because the state of the art discussed in the previous office action cited peer-reviewed journal articles by those of skill in the art that demonstrate the unpredictability of applying such teachings from mammalian systems to plant systems.

Applicants' main arguments summarized from page 15-23 appear to be that the specification teaches the generation of SATACs generally, and that these teachings would apply to many different species.

This is not persuasive because the specification throughout has multiple references to specific mammalian sequences, constructs and cell lines, and the

procedures involving the generation appear to be specific to the mammalian SATACs. This is evidenced in the multiple references to MACs, or Mammalian Articifial Chromosomes. While the specification does mention in passing that these procedures should work on other species, there is no demonstration of this in the specification, and there is no guidance that would teach one to modify the procedures sufficiently to actually generate the SATACs reliably in other species.

Applicants further urge (pages 17-20 of the reply) that multiple techniques are present in the specification for introduction of SATACs into cells, methods for producing transgenic plants were known in the art, materials and methods for applying the procedures to plants were readily available and that the presence of working examples is sufficient for enablement.

This is not persuasive because none of the taught methods for plants were modified to account for the generation and/or isolation or the introduction of SATACs into plants. The methods mentioned in the specification only demonstrate the transformation options for plants of DNA constructs, not SATACs which would have considerably more DNA and require significant modification before successful introduction into a plant cell could be achieved. The working examples are all for mammalian cell lines and none are for other species.

Applicants further urge that applying the teachings of the specification combined with the skill and knowledge of the art would result in predictable success for transferring SATACs into plant cells.

This is not persuasive because the unpredictability cited in the previous office action has not successfully been overcome. The transmission of SATACs has not been demonstrated in plants and the introduction of SATACs into plants has not been demonstrated.

Applicants point out that they are entitled to claims that are commensurate in scope with the teachings of the specification. The main argument seems to be that one using the methods taught in the application could generate SATACs in any species. Without agreeing to the veracity of that statement, the Examiner points out that by their own admission Applicants already have patents drawn to the generic scope with which they claim they are entitled to. However, in the instant application, Applicants appear to be claiming a species within that scope. In order to have a particular species enabled, in this case under the broad heading of "plants", one should have at least demonstrated even one species of plant in which the methods were applied. Applicants do not demonstrate anywhere in the application the generation of a plant SATAC, nor do they demonstrate the isolation of a plant SATAC. The declarations presented by Applicant may only overcome the enablement rejection if the declarations clearly show that the exact method steps taught in the specification were used exactly the same on plant cells and a successful generation, transmission and isolation of a plant SATAC was achieved. However, as shown in the declaration, one does have to modify the conditions associated with the methods and the exact same methods were not therefore used to generate and obtain plant SATACs.

Applicants continue to urge that the data presented in declarations 1-4 demonstrate the generation of plant SATACs based on the **description in the specification**.

This is not persuasive for a variety of reasons, many of which are already on record. First and foremost, the cytological techniques that would be required for plant cells are different than those of mammalian cells and therefore are not adequately described in the specification. However, even in the event one could generate plant SATACs based on the description, providing evidence of generated SATACs is not complete without providing evidence of a plant centromere since Applicant has agreed that in order to be defined as a plant artificial chromosome it must contain a plant centromere. A generated fragment containing rDNA is not evidence of a SATAC as a broken amplified fragment could contain rDNA but still be lost upon cell division. In order to be stably maintained and in order to fit the definition of the plant artificial chromosome an identifier of the plant centromere would be required. However, given the fact that such sequences and structures and functions were not known in plants at the time of invention, the existence of a plant centromere in plant SATAC has not been shown.

It is believed that main arguments presented by Applicant have been herein addressed.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 50-52, 73, 80, 88-92, 94-96, 98-100, 107, 114, 117-118 and 120-122 remain rejected under 35 U.S.C. 102(b) as being anticipated by Richards et al (US 5270201, issued 14 December 1993). The rejection is maintained for the reasons of record in addition to the reasoning set forth below.

The instant claims are drawn to a method for producing a transgenic plant comprising introducing a satellite artificial chromosome (SATAC) into a plant cell and growing the plant cell under conditions to produce a transgenic plant.

Richards et. al. teach a method of making an artificial plant chromosome (column 33, Example 19 and Figure 10(C)), using it to transform plant cells (column 7, lines 3-6), regenerating a whole plant (column 10, lines 34-37), wherein the plant cell is a protoplast (column 10, lines 35-36), wherein the artificial chromosome encodes a gene product (column 10, lines 53-56), wherein the artificial chromosome is introduced by direct DNA transfer (column 7, lines 3-6), and wherein the plant cell is from a monocot, a dicot or an algae (column 10, 34-38).

The prior art herbicide resistant form of a normally occurring enzyme is a heterologous encoded gene product.

The MPEP states "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art,

the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Additionally, where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). Additionally, the method steps recited in claim 92 do not form a nexus between the introduced DNA fragment and the produced SATAC, and the SATAC of claims 50-52, 73, 80, 88-92, 94-96, 98-100, 107, 114, 117-118 and 120-122 is thereby anticipated by that of Richards et al.

Applicant urges that Richards et al does not disclose an artificial chromosome that contains more heterochromatin than euchromatin, and as such does not disclose a SATAC or even "a hint of whiff of disclosure of a SATAC" and therefore can not anticipate the claims of the instant application.

Applicant's traversal is unpersuasive. The instant claims, especially claim 92, the single independent claim, are not drawn to a method of making an artificial chromosome through amplification, nor are these claims drawn to an artificial chromosome which is predominantly heterochromatic.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., to a method of making an artificial chromosome through amplification, to an artificial chromosome which is predominantly heterochromatic) are not recited in the

rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See In re Van Geuns, 988 F.2d 1181,26 USPQ2d 1057 (Fed. Cir. 1993).

Double Patenting

Claim Rejections - 35 USC § 103

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 92, 95, 99, and 114-115 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 12-13, 19-20, 26 and 52-54 and 66 of copending Application No. 10287313. Although the

conflicting claims are not identical, they are not patentably distinct from each other because both sets of claims are drawn to SATACs and transgenic plants comprising SATACs. The claims are coextensive.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 87-92, 94-99, 114-115, and 117-121are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 41, 49, 52-53, 55, 63-65, 69-70, 73 and 76 of copending Application No. 11284877. Although the conflicting claims are not identical, they are not patentably distinct from each other because both sets of claims are drawn to SATACs, transgenic plants comprising SATACs and isolated plant SATACs. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brent Page whose telephone number is (571)-272-5914. The examiner can normally be reached on Monday-Friday 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg can be reached on (571)-272-0975. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Brent T Page

RUSSELL P. KALLIS, PH.D.
PRIMARY EXAMINER

Russell Kallis